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It is generally recognized that the honeybee is of great value to agriculture and related industries where pollination is a factor. Claims are often expressed that the honeybee is from ten to ninety times more valuable to the plant industries as a pollination agent, each season, than the annual monetary value of the honey crop.

Beekeepers recognize that some colonies and some races of bees are more industrious than others in collecting honey, but the field of pollination has not been sufficiently investigated to establish which race of bees, if any, is the best pollination agent.

The initial interest in this problem was to attempt to determine by some means of measurement the average and range in size of the pollen basket of the common races of bees.

Fifty specimens of each race were selected for this study. They were mounted in cells, two to a slide, in isobutyl methacrylate polymer dissolved in xylol.

Before it was decided what measurements were to be taken, a careful study of the loaded pollen basket was made, which revealed that pollen was carried in nearly the entire tibial area, except the extreme proximal portion.

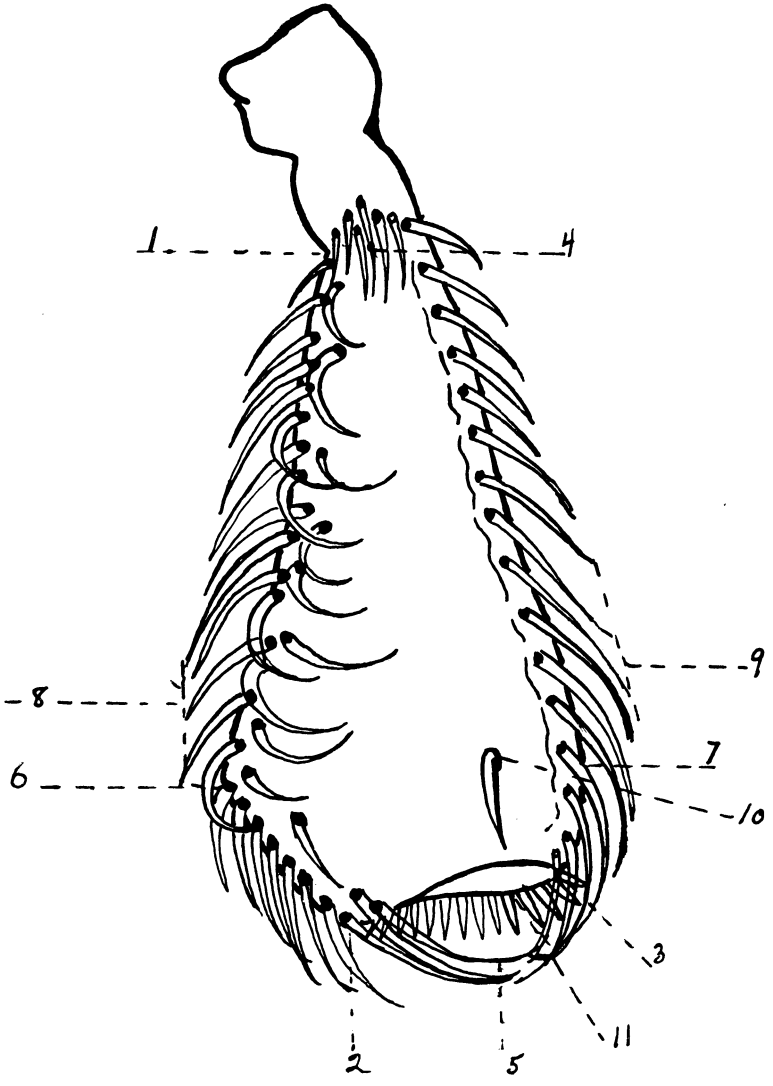
Measurements were made using a projection lantern magnifying 100 times. Magnification was checked with a Bausch and Lomb stage micrometer. A measuring screen was constructed by using a 30″ by 40″ piece of one-quarter inch plywood onto which was centrally bolted a 22″ disk of double plywood which carried a 40 by 50 centimeter piece of millimeter paper. The millimeter disk could be rotated to any position so that millimeter lines extended between any two points. All measurements were read in millimeters and reduced to true readings by dividing by 100, the magnification figure.

The following measurements were taken as illustrated in figure 1, and listed in tables I and II.

1. Proximal ventral curve of tibia (1) to distal tibio-tarsal point (2).

2. Proximal ventral curve of tibia (1) to distal dorsal posterior point at the margin of the pecten (3).

3. Midpoint of anterior tibial surface in vertical plane with proximal ventral curve of tibia (4) to meeting point of distal corbicular bristles (5).
4. Greatest width of tibia or corbicula, ventral (8) to dorsal margin (7).
5. Greatest extent of corbicula bristles, ventral (8) to dorsal (9).
6. Distance of intra-corbicular bristle (10) to distal posterior margin of pecten (11).



Pollen Basket

The mean, and the minimum and maximum range figures were found to be greater for the Caucasian race (table I) than the other races studied. The Carniolan race was found to be second in size to the Caucasians in all pollen basket measurements with

Table I — Range, Means, and Probable Error of Measurements of Pollen Baskets

50 Specimens from Each Race				5 Specimens from Each of 10 Colonies		
Measurements taken / Race	1-2	1-3	4-5	6-7	8-9	10-11
Italian						
Range	2.82-3.03	2.78-3.05	3.00-3.24	1.08-1.18	1.67-2.00	.41-.56
Mean	2.94	2.93	3.12	1.13	1.80	.49
P. E.	±.035	±.038	±.040	±.015	±.047	±.025
Caucasian						
Range	2.93-3.17	2.97-3.19	3.11-3.40	1.14-1.23	1.73-2.15	.43-.64
Mean	3.05	3.08	3.29	1.18	1.89	.52
P. E.	±.038	±.038	±.044	±.015	±.054	±.032
Carniolan						
Range	2.80-3.10	2.78-3.12	3.10-3.29	1.08-1.21	1.65-1.90	.41-.60
Mean	2.97	2.96	3.18	1.15	1.76	.48
P. E.	±.033	±.030	±.035	±.058	±.036	±.039

the exception of the range and mean of the extent of the corbicular bristles, ventral (8) to dorsal (9). Measurement (10) to (11) is not to be regarded as a pollen basket measurement, but only the location of a solitary bristle.

In this study the Italian race was found to be third in size. However, in the Italian group (table II) all selected from one

Table II — Range, Means, and Probable Error of Measurements of Pollen Baskets

Measurements taken / Race	1-2	1-3	4-5	6-7	8-9	10-11
Italian						
Range	2.85-3.15	2.84-3.20	3.02-3.40	1.10-1.21	1.70-2.01	.40-.60
Mean	2.97	2.98	3.20	1.15	1.85	.50
P. E.	±.040	±.053	±.050	±.020	±.046	±.020

colony, the range and mean figures were slightly larger than the Italian group of table I.

Probable errors were calculated from 50 cases. The greatest difference between any of the mean figures was 0.17. Figures from these groups were analyzed statistically, the results indicating that their difference was not significant.

Since it is a well established fact that some colonies of bees are

more industrious than others, it is possible that the characteristics of size of pollen basket and industry could be combined. The factor of size of pollen load carried has not been thoroughly investigated under varying conditions where pollination is of importance.

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